



3 0864 1006 2379 5

Ronald L. Rivers, M.D.
State Medical Examiner

Arnold B. Melnikoff
Laboratory Bureau Chief

Dawn M. Kangas
Administrative Assistant

STATE
OF
MONTANA

DIVISION OF FORENSIC SCIENCE

DEPARTMENT OF JUSTICE

275 West Front Street, Missoula, MT 59802 (406) 728-4970

MAY 1984

363.25
J5m
May 1984
**SHELVED WITH
PERIODICALS**

FIREARMS RESIDUE EVIDENCE COLLECTION

1. If a commercial gunshot residue kit* is not available the following supplies will be needed:

- A) A 5% Nitric Acid Solution (may be obtained at a pharmacy or high school)
- B) "Johnson and Johnson" brand "Q-tips" blue plastic swabs - at least six. Do not use wooden swabs.
- C) Plastic bags or vials - at least six.
- D) A pair of gloves.

* Commercial kits can be obtained from:

SIRCHIE

or

Criminal Research Products

P.O. Box 30576

P.O. Box 408

Raleigh, North Carolina 27612

Conshohocken, Pennsylvania 19428

Phone: (919) 781-3120

Phone: (215) 828-5326

2. Procedure

- A) A person swabbing the hands should wear gloves. Also avoid touching the subjects hand except with swabs to avoid right and left cross contamination.
- B) Dampen one or two swabs with 2 to 3 drops each of the 5% nitric acid solution. Do not dip the swabs into the acid bottle at any time.
- C) Swab the back of the right hand especially around the thumb, index finger and web. Place swab in plastic container and LABEL appropriately.
- D) Repeat the procedure for the back of the left hand, and right and left palms. Each surface requires separate swabbing with separate applicators.
- E) If a cartridge case is available, swab the interior using the above method.
- F) Dampen a clean swab with the 5% nitric acid, place in a similar plastic container, and label it "control sample".
- G) Seal evidence and attach DFS form or letter to outside of package. Include subject's name, weapon used, time and date of incident, time and date residue collected and name of investigating officer.

ON CALL SCHEDULE - MONTANA STATE MEDICAL EXAMINER

MAY 1984

275 W. Front Street
Missoula, Montana 59802

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1	2	3	4	5 JOHN PFAFF
6 JOHN PFAFF	7	8	9	10	11 30th Annual Montana Coroner Conference Helena	12 KEN MUELLER
13 KEN MUELLER	14	15	16	17	18	19 RON RIVERS
20 RON RIVERS	21	22	23	24	25	26 JOHN PFAFF
27 JOHN PFAFF	28 JOHN PFAFF	29	30	31		

Telephone Numbers: State Office - 728-4970
WATS Line - 243-5796

Home Phone: Dr. Ron Rivers- 728-2033 (Home)
(week nights call unless otherwise indicated)

Dr. John Pfaff - Great Falls
Hospital - 727-3333
Home - 727-3905

Dr. Ken Mueller- Billings
Hospital - 657-7000
Home - 248-3024

MAY 1984
GUNSHOT RESIDUES
R. L. Rivers, M.D. and
Bill Newhouse, B.S.

"I didn't know the gun was loaded." The police chief asked himself how many times he had heard this before. And then a second familiar statement by the homicide suspect, "She grabbed the gun and it just went off. I didn't mean to shoot her."

Eight hours previously the victim had been rushed to the hospital with a gunshot wound to the chest. She had died in surgery two hours later.

"Well, we better swab his hands for the gunshot residue test", the sergeant noted. "Forget it", answered the chief.

"Well then, I guess we don't need to swab the victim's hands either, especially since she's been in the hospital." The chief asked, "What kind of gun was used?" "A .357 revolver," answered the sergeant. "Get the swabs on her", answered the chief.

QUESTIONS:

- 1) Why take swabs on the victim and not the suspect?
- 2) What type of revolver will not leave gunshot residue?
- 3) How do you interpret a gunshot residue test?

ANSWERS:

1. It is useless to take swabs on a living subject longer than four hours after the gun has been fired. Even if the hands have not been washed or stuck in a pocket, the normal sweat of a person will bathe the trace residues off.

However, a dead subject will have residues forever depending on how well the hands are protected. In this example the victim died only two hours after being shot. The hands of a patient are not ordinarily washed before surgery so there could be a chance of getting a positive test. However, anytime a victim's hands are not immediately covered with new, clean, paper bags there is a possibility of the loss of residue and worse, the contamination of the hands. Anybody who has touched a recently fired gun can contaminate the hands.

2. All revolvers may leave gunshot residues, but .22 rimfire ammunition, except FEDERAL^R, does not contain antimony and barium. Antimony and barium are two metals whose simultaneous occurrence any place other than gunshot or primer residue is extremely unlikely. The small primer, which ignites from the force of the firing pin, ignites the gunpowder or main propellant charge in a bullet. The primer contains these chemicals as well as any others, but all the other chemicals are too common to be of significant benefit.

These two elements are typically deposited on the thumb and the index finger beneath the cylinder gap of a revolver. But all firearms leak the gases to a certain extent. If two hands are used, either or both may have deposits so swab the right and left hands in all cases.

Typically, more than 300 ng of barium and 80 ng of antimony are found on a shooter's hands after firing a handgun. The average background level is 25 and 5 ng (parts per billion) of barium and antimony respectively. The Albuquerque Police Laboratory has established that 150 ng barium and 30 ng antimony are the minimum levels necessary from primer residue to be positive. This level is less than the typical deposit, but it is six times the average background.

There are antimony mines in Montana so both barium and antimony must be present in the requisite amounts before a test is called positive; the presence of other metals alone is insufficient.

3. There is a 70% correlation between a positive test and the act of firing a handgun. In the other 30% the values are too low to be positive but we must avoid ever calling a false positive. Remember this means positive for firing a gun or handling a recently fired gun.

A negative test is fairly frequently seen in autoloaders, rifles and shotguns. Even revolvers may not always leave a residue.